



STATE OF WASHINGTON

DEPARTMENT OF ECOLOGY

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March 24, 2003

The Honorable John Simmons, Chairman
Nisqually Indian Tribe
4820 She-Nah-Num Drive SW
Olympia, WA 98513

Dear Chairman Simmons,

RE: Discharge of Dinitrotoluene-Impacted Groundwater to Puget Sound is Not a Risk

I hope this letter finds you in good health and good spirits. This letter and the enclosures are to answer a question you asked me during the tour of the Weyerhaeuser-DuPont cleanup site a number of months ago. Your question related to the discharge of dinitrotoluene-contaminated groundwater to Puget Sound and human health concerns regarding the consumption of fish and shellfish from that area at rates typical of Native American diets. This is a long letter, as there are lots of issues to cover and explain. In brief, the answer is that the discharge does not present a risk.

As background, I had mentioned that the groundwater contains low levels of dinitrotoluene (DNT), a compound that was used in the making of explosives at the former DuPont Works site. Soil known to contain elevated concentrations of DNT have been removed from the site, as part of earlier interim cleanup actions. DNT is consistently detected in five on-site groundwater monitoring wells, one former industrial production well, and in one of two visible groundwater seeps that discharge directly into Puget Sound. These locations are located downgradient, in terms of ground water flow direction, from areas where DNT had been found in soil. Many of the other monitoring wells on site have either non-detectable or sporadic detections of DNT but at very low concentrations. The concentrations of DNT in groundwater are low, but so are the drinking water standards. I have included a table from a February 13, 2003 memo which provides the results of prior groundwater and seep sampling results over the past 14 years. It also includes the most recent sampling data from March 2002. Here are a few facts for comparison purposes:

1. The Washington State Model Toxics Control Act (MTCA) groundwater cleanup standard for DNT is 0.129 parts per billion (ppb);
2. The detected groundwater concentrations of DNT over the past six years have ranged from 0.05 ppb to 0.76 ppb.
3. The detected groundwater concentrations of DNT since 1988 have ranged from 0.05 ppb to 3.8 ppb.
4. Of the 30 groundwater sampling locations, seven have consistently shown low concentrations of DNT, as noted above.
5. There have been 34 rounds of groundwater sampling over the past 14+ years.

Drinking water for the historic village of DuPont and the Northwest Landing development comes from supply wells located upgradient of DNT groundwater contamination and are free of DNT.

The Washington State marine surface water quality standard for DNT is 9.1 ppb, which is based on EPA's National Toxics Rule. That marine standard is based on protection of human health through consumption of fish and shellfish. The Washington State marine surface water quality DNT standard for the protection of marine organisms is 1,360 ppb. DNT does not tend to bioaccumulate in fish or shellfish. Here are a few facts about the two marine water quality standards:

1. The 9.1 ppb marine water quality standard is based on 70 years of potential exposure, a one in one million cancer risk, and consumption of 6.5 grams of fish and shellfish per day. That consumption rate is not typical of the average Northwest "coastal" Native American. For reference, one pound equals 454 grams and a nickel weighs 5 grams.
2. The 1,360 ppb marine water quality standard is based on protection of marine organisms themselves, not human consumption of those organisms.
3. The Port Gamble S'Klallam Tribe has adopted marine surface water quality standards for waters within their Reservation boundary. Their marine water quality standard is based on a fish and shellfish consumption rate of 146 grams per day, or about 1/3 of a pound per day. The Department of Ecology used the Port Gamble S'Klallam Tribe's water quality standard to evaluate the potential risk to Nisqually Tribal members who might catch fish and harvest shellfish in the DuPont area. I have enclosed a copy of the document entitled "Port Gamble S'Klallam Tribe Water Quality Standards for Surface Water. Adopted 8/13/02". The DNT risk level the Port Gamble S'Klallam Tribe Water Quality Standard is based on is the prevention of a cancer risk in excess of one-in-one million.

I presented your question to one of Ecology's toxicologists (who specializes in human health issues) and to a professional engineer (with water quality expertise). The toxicologist provided me a copy of the adopted Port Gamble S'Klallam Tribe's Water Quality Standards for Surface Water (enclosed). As noted above, their standards are based on higher fish and shellfish consumption rates. The Port Gamble S'Klallam Tribe's water quality criteria for 2,4-DNT, consumption of fish and shellfish (marine organisms) is 0.41 ppb. The Tribe's water quality criteria apply to surface waters of the Port Gamble S'Klallam Reservation. While those specific standards do not apply to the waters of Puget Sound near the former DuPont Works cleanup site, Ecology has chosen to use them for comparison purposes. Those tribe's standards, and the underlying assumptions related to fish and shellfish consumption rates, best address your question. The groundwater monitoring location at DuPont closest to Puget Sound and used for comparison purposes is Seep #1. Seep #1 is only visible at low tide.

The Port Gamble S'Klallam Tribe's water quality standard for DNT is higher than concentrations found in Seep #1, which ranged from non-detection (below 0.02 ppb) to 0.27 ppb. Seep #1 was sampled 25 times, during 34 groundwater sampling events starting in October 1988. DNT was detected 21 of the 25 samples. The average DNT concentration for the 25 sampling events is 0.1214 ppb. If you compare the Tribe's standard of 0.41 ppb to all the groundwater and seep samples collected since 1988, less than 10% are at or above the standard. One other point to make is that DNT concentrations found in groundwater are higher than the concentration that would likely be found in Puget Sound, due to dilution. I am not suggesting that dilution is the solution, but rather that dilution of DNT groundwater concentrations reduces the overall risk to human health.

Here are a few more facts to point out, to help clarify some of the information above:


1. The maximum concentration of DNT detected (0.27 ppb) in Seep #1 is 34% less than the applicable risk-based value - Port Gamble S'Klallam Tribe's standard of 0.41 ppb.

2. The average concentration of DNT detected in Seep #1 is about 70% lower than the risk-based value of 0.41 ppb. (How was the "average concentration of DNT" determined? If a sample was submitted to the laboratory and DNT was not detected, then ½ of the detection limit was used in calculating the average DNT concentration, to be conservative. For example, in October 1997, DNT in Seep #1 sample was not detected above 0.03 parts per billion, so 0.015 ppb was used for that sampling event when figuring the overall average, rather than 0.0 ppb. You will see the laboratory data sheet (Table 1 enclosed) shows 0.03U for the seep #1 sample in October 1997. The "U" stands for undetected. On Table 1, you will also note the total DNT concentration is in units noted as "µg/l". That term, µg/l, is "micrograms per liter" which is equivalent to parts per billion.)
3. The risk-based value is based on one of two common isomers (forms) of DNT, specifically 2,4-DNT, which is toxic and a potential human carcinogen. The other isomer is 2,6-DNT, which is also a potential human carcinogen, but is less toxic. The data collected at the DuPont site is based on total DNT, which is a mixture of the two isomers (2,4 DNT and 2,6-DNT). The March 2002 groundwater sampling data indicated only 2,6 - DNT; the 2,4 - DNT isomer was not detected.

The Washington State Department of Ecology wants to ensure the cleanup being conducted at the former DuPont Works site is protective of all peoples of the State, which includes members of the Nisqually Nation. As I noted at the beginning of this letter, the low level of DNT-contaminated groundwater discharging to Puget Sound does not exceed risk-based criteria that is protective of tribal members who for 70 years might eat fish or shellfish from near the former DuPont Works cleanup site.

I realize I have included a lot of details in this letter. If you have any questions regarding this letter, I can be reached at (360)407-6262 during normal business hours. If it is more convenient for you to call me (or to meet) in the evening or on the weekend, leave me a message at work and I will provide you with my home phone number.

Sincerely,



Mike Blum
Project Manager
Toxics Cleanup Program

ENCLOSURES

- 1) Map of groundwater sampling locations
- 2) Table 1: Summary of Total DNT Data for Groundwater
- 3) Port Gamble S'Klallam Tribe Water Quality Standards for Surface Waters. Adopted 8/13/02
- 4) Figure A: Seep data for total Dinitrotoluene (DNT) at DuPont site

cc: Bill Tobin, Attorney for the Nisqually Tribe
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